

PATENT COOPERATION TREATY

PCT

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 228159WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/31528	International filing date (day/month/year) 31 October 2003 (31.10.2003)	Priority date (day/month/year) 31 October 2002 (31.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): H05H 1/00; H01L 21/00 and US Cl.: 156/345.24; 438/5		
Applicant TOKYO ELECTRON LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 26 March 2004 (26.03.2004)	Date of completion of this report 27 January 2005 (27.01.2005)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Gregory Mills  Telephone No. (571)272-1700

Form PCT/IPEA/409 (cover sheet)(July 1998)

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I. Basis of the report**1. With regard to the elements of the international application:***☒ the international application as originally filed.☒ the description:pages 1-16 as originally filedpages NONE filed with the demandpages NONE filed with the letter of _____.☒ the claims:pages 17-22 as originally filedpages NONE as amended (together with any statement) under Article 19pages NONE filed with the demandpages NONE filed with the letter of _____.☒ the drawings:pages 1-9 as originally filedpages NONE filed with the demandpages NONE filed with the letter of _____.☐ the sequence listing part of the description:pages NONE as originally filedpages NONE filed with the demandpages NONE filed with the letter of _____.**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4. ☐ The amendments have resulted in the cancellation of:**☐ the description, pages NONE☐ the claims, Nos. NONE☐ the drawings, sheets/fig NONE**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).****

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. STATEMENT**

Novelty (N)	Claims <u>5 and 24</u>	YES
	Claims <u>1-4, 6-23 and 25-43</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-43</u>	NO
Industrial Applicability (IA)	Claims <u>1-43</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-4, 6-23 and 25-43 lack novelty under PCT Article 33(2) as being anticipated by Coronel et al (US Patent No. 5,658,418).

Coronel et al teach a plasma processing system (Fig. 3) for etching a layer on a substrate, the apparatus comprising: a process chamber 22; and a monitoring device 28 for monitoring the state of etching of a wafer 24 by plasma etch process, the monitoring device 28 includes illuminating light source 29, optical cable 30, collector lens 31 and optical cable 32 in communication with a spectrometer 33 which is connected to analyzing unit 34; and a computer 36 for controlling the operation of the etch chamber 22 in response to the detected signal from the analyzing unit 34. the apparatus measure the etch rate and etch end point using detected light intensity versus time (the entire document).

Claims 5 and 24 lack an inventive step under PCT Article 33(3) as being obvious over Coronel et al (US Patent No. 5,658,418) in view of Williams et al (US Patent No. 5,467,013).

Coronel et al teach all limitations of the claims as discussed above except for the diagnostic system is an electrical diagnostic subsystem comprising at least one of a voltage probe, a current probe, a spectrum analyzer, an external RF antenna, a power meter, and a capacitor setting monitor.

Williams et al teach a radio frequency monitoring device for a semiconductor plasma processing system, the RF monitoring device includes a sensor 13 to measure voltage, current and phase angle associate with plasma and the measured values are used for controlling an ongoing plasma process (column 2, line 50 through column 5, line 67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the plasma monitoring device as taught by Williams et al in the apparatus of Coronel et al as an art recognized equivalent means of monitoring the state of plasma during plasma processing the wafer.

Claims 1-43 meet the criteria set out in PCT Article 33(4), and thus the plasma etch rate monitoring system has the industrial applicability because the subject matter claimed can be made or used in plasma etch processing of semiconductor industry.

----- NEW CITATIONS -----